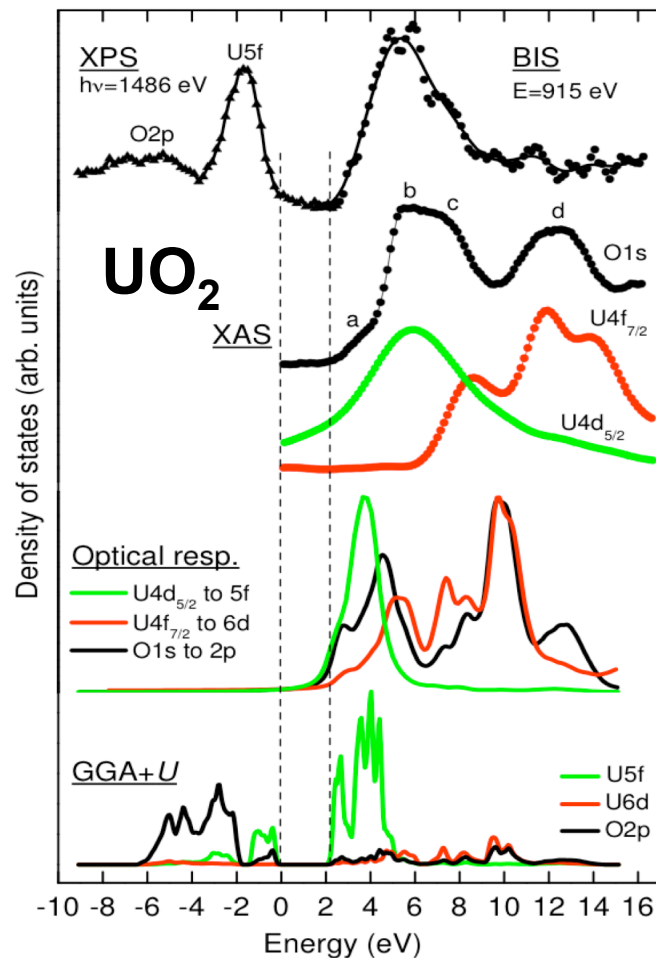


# Recent Highlights – February 2011



- $\text{UO}_2$  is the most widely used nuclear fuel and exhibits strong electron correlation effects.
- We are investigating  $\text{UO}_2$  with a powerful array of techniques and an international collaboration.
- **Take-home message:  $\text{UO}_2$  is an f-f electron correlated system.**



Bremstrahlung Isochromat Spectroscopy (BIS) and X-ray Photoelectron Spectroscopy (XPS), onsite here at LLNL

X-ray Absorption Spectroscopy (XAS) at the Advanced Light Source

Theory (GGA+U and spectral simulations) from the Max-Planck Institute for Microstructure Physics in Halle, Germany

“f-f origin of the insulating state in uranium dioxide: X-ray absorption experiments and first-principles calculations,” by S.-W. Yu, J. G. Tobin, J. C. Crowhurst, S. Sharma, J. K. Dewhurst, P. Olalde-Velasco, W. L. Yang, and W. J. Siekhaus, Phys. Rev. B, in press (2011).